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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/492,373	01/27/2000	Yuzo Horikoshi	991444	9795

23850 7590 11/14/2003

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EXAMINER

SHOSHO, CALLIE E

ART UNIT PAPER NUMBER

1714

DATE MAILED: 11/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/492,373

Applicant(s)

HORIKOSHI ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,6-10 and 14-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,6-10 and 14-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Applicant Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/8/03 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 4, 6-10, and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. (U.S. 6,248,805) in view of Patel et al. (U.S. 5,977,210) and Fujisawa et al. (U.S. 5,997,136).

Nguyen et al. disclose an ink jet ink comprising (i) 0.1-10% polymer which is obtained from 5-95% hydrophobic monomer such as alkyl (meth)acrylate, 5-95% hydrophobic monomer such as styrene, and 0-30% monomer which has a highly polar functional group including (meth)acrylic acid, (ii) solvent which is liquid at room temperature, and (iii) 0.5-10% colorant which is a dye or pigment wherein the colorant is dispersed in the polymer. The polymer has glass transition temperature of -25 to 110 °C and is produced using emulsion polymerization. The ink is printed using an ink jet printer, which would intrinsically possess an ink cartridge to store the ink. It is also disclosed that in one embodiment, the polymer encapsulates the colorant so that the colorant clearly absorbs on or coats the surface of the polymer, however, it is further disclosed that there is no limit to the type of association between the colorant and the polymer. Further, given that all the ingredients are mixed together when forming the ink, is clear that the

colorant is intrinsically dispersed in the solvent (col.4, lines 39-48 and 52-53 and 63-64, col.5, lines 18-20 and 25-34, and col.6, lines 8-20, 26-36, and 46-50, col.7, lines 34-55, col.10, line 48, col.13, lines 58-60, col.19, lines 54-61, col.22, lines 8-10, and col.26, line 66-col.27, line 15).

Although there is no explicit disclosure in Nguyen et al. that the surfactant covers a surface of the copolymer, given that the surfactant and copolymer are mixed together in Nguyen et al. (see examples), it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer.

The difference between Nguyen et al. and the present claimed invention is the requirement in the claims of (a) the volume average particle diameter of the polymer, (b) softening temperature of the polymer, and (c) piezo-type ink jet head.

With respect to difference (a), on the one hand, given that Nguyen et al. produces the polymer by emulsion polymerization as presently claimed, it would have been natural for one of ordinary skill in the art to infer that the polymer intrinsically possesses the same volume average particle diameter as presently claimed, and thus one of ordinary skill in the art would have arrived at the claimed invention.

On the other hand, Patel et al., which is drawn to ink jet inks, disclose the use of polymer having volume average particle size of 0.1-1 micron in order to produce an ink that will not clog the printer nozzles (col.3, lines 14-15 and col.4, lines 57-59).

In light of the motivation for using copolymer having specific volume average particle diameter disclosed by Patel et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polymer with such volume average particle diameter in the

ink of Nguyen et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

With respect to difference (b), on the one hand, given that Nguyen et al. discloses copolymers identical to those presently claimed, i.e. obtained from the same types and amounts of monomers, it would have been natural for one of ordinary skill in the art to infer that the polymers intrinsically possess the same softening temperature as presently claimed, and thereby arrive at the claimed invention.

On the other hand, Fujisawa et al., which is drawn to ink jet inks, disclose that the softening temperature of polymers utilized in ink jet inks range from 50⁰ -120⁰ C wherein such temperature allows the ink to be heated quickly so that the ink dot is formed before penetration of ink into recording medium occurs so that feathering of the ink on the recording medium is prevented (col.3, lines 13-35).

In light of the motivation for using polymer with specific softening temperature disclosed by Fujisawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polymer with such softening temperature in the ink of Nguyen et al. in order to produce an ink which does not feather, and thereby arrive at the claimed invention.

With respect to difference (c), Nguyen et al. disclose the use of thermal ink jet printers (col.2, lines 46-52), however, there is no explicit disclosure of the use of printers containing piezo-type inkjet head as presently claimed.

Patel et al., which is drawn to ink jet ink, disclose the equivalence and interchangeability of thermal ink jet printer, as disclosed by Nguyen et al., with piezoelectric ink jet printer, as

presently claimed, as devices used to cause droplets of ink to be ejected in an imagewise pattern on a substrate to generate images (col.7, lines 36-43).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use piezoelectric ink jet printer to print the ink of Nguyen et al., and thereby arrive at the claimed invention.

Response to Arguments

5. Applicants' arguments filed 8/8/03 have been fully considered but they are not persuasive.

Specifically, applicants argue that:

(a) Nguyen et al. disclose use of styrene in amount less than 30 wt.%, which is outside the scope of the present claims, which require 40-80 wt.% styrene.

(b) Nguyen et al. disclose that copolymer is obtained by dispersion polymerization not emulsion polymerization.

With respect to argument (a), it is agreed that col.5, lines 6-7 of Nguyen et al. disclose polymer obtained from less than 30 wt.% styrene. However, this is but one preferred embodiment of Nguyen et al. It is noted, "nonpreferred disclosures can be used. A nonpreferred portion of a reference disclosure is just as significant as the preferred portion in assessing the patentability of claims." *In re Nehrenberg*, 280 F.2d 161, 126 USPQ 383 (CCPA 1960). A fair reading of the reference as a whole discloses that styrene is broadly used in amounts of 5-95%, which clearly overlaps the amount of styrene presently claimed (col.4, lines 45-48 and 56-57).

Further, this portion of Nguyen et al. also discloses other preferred amounts of styrene including 10-60 wt.% and 15-50 wt.%, which each overlap the amount of styrene presently claimed.

In light of the overlap between the amount of styrene presently claimed and that disclosed by Nguyen et al., it therefore would have been obvious to one of ordinary skill in the art, absent evidence to the contrary, to use styrene in amounts, including those presently claimed, and thereby arrive at the claimed invention.

With respect to argument (b), applicants state that Nguyen et al. disclose use of dispersion polymerization as shown in Figure 1. However, it is not clear how Figure 1 shows that polymer of Nguyen et al. is obtained by dispersion polymerization. Clarification is requested.

Further, it is noted that col.3, lines 47-49 and col.6, lines 26-36 of Nguyen et al. disclose that the polymer is obtained by emulsifying the monomeric components and then conducting free-radical polymerization in water. Thus, it is clear that Nguyen et al. disclose the use of emulsion polymerization as presently claimed.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Freeman et al. (U.S. 2002/0065347) disclose ink jet ink comprising binder obtained from styrene, alkyl (meth)acrylates, and 1-10% (meth)acrylic acid wherein the binder has average particle diameter of 250 to 400 nm and glass transition temperature of -25 to 25 °C. However, there is no disclosure that the binder is obtained from 40-80 wt.% styrene as presently claimed.

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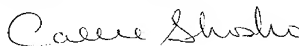
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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
11/5/03